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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/722,701
Filing Date: November 25, 2003
Appellant(s): KISELEV ET AL.

Brenna A. Brock

For Appellant

EXAMINER'S ANSWER

This is in response to the Appeal Brief filed July 14, 2008, appealing from the Office action mailed November 06, 2007.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings, which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6,691,245	DeKoning	10-2000
2004/0172509	Takeda	06-2003
6,377,959	Carlson	05-1996

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-10 and 13-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over DeKoning (US Patent No. 6,691,245) filed October 10, 2000, in view of Takeda (US Patent Application No. 20040172509) filed June 23, 2003.

Regarding Claims 1, 13, 16, and 19, DeKoning discloses a method comprising:

receiving a request to read a portion of data from first data storage (column 5, lines 20-29, DeKoning), wherein the request is received by a receiving module of a first host, the first host can access the first data storage (Fig.1; column 6, lines 26-28 and 63-65, DeKoning)¹, and the first host cannot access second data storage (column 6, lines 45-55, DeKoning)²;

requesting a requested portion of a copy of the data in the second data storage from a second host that can access the second data storage (Fig.1; column 6, lines 63-67 and column 7, lines 1-5 & 22-40, DeKoning); and

receiving the requested portion from the second host (column 9, lines 39-62, DeKoning). However, DeKoning is silent with respect to reading the portion of the data by reading the requested portion received from the second host, and when a sub-portion of the portion of the data is not included in the requested

¹ Examiner Notes: Within Fig.1, item 106 represents the first host and item 108 represents the first data storage. Also, communication link 118 demonstrates how the first host has access to the first data storage.

² Examiner Notes: As stated within column 6, lines 45-55, if a disaster disrupts the first data storage and/or the first host, the second host and second data storage will not be affected, because they are storage at a remote location. Also, as seen within Fig.1, the first host 106 is connected to the first data storage 108, only, and the first data storage connects to the second data storage 110, by communication link 122. As can be seen there is no direct link (i.e. access) from the first host 106 to the second data storage 110.

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portion received from the second host, reading the sub-portion from the first data storage. On the other hand, Takeda discloses reading the portion of the data by reading the requested portion received from the second host ([0061-0062], Takeda), and when a sub-portion of the portion of the data is not included in the requested portion received from the second host, reading the sub-portion from the first data storage ([0063-0065], Takeda). DeKoning and Takeda are analogous art because they are from the same field of endeavor of data storage with remote mirrors. It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate Takeda's teachings into the DeKoning system. A skilled artisan would have been motivated to combine as suggested by Takeda at [0005] and [0012], in order to devise a technology where a plurality of storage subsystems connected through a network, are managed collectively and provided to the user as a plural subsystem. Thereby, allowing the user to use the plurality of storage subsystems as if it were a single storage subsystem, allowing for less trafficking to the hosts.

Regarding Claims 2, 14, 17, and 20, the combination of DeKoning in view of Takeda, disclose the method further comprising:

determining that a second portion of the data in the first data storage is unavailable (column 10, lines 51-54, DeKoning);

creating a third data storage upon performing the determining, wherein the first host can access the third data storage ([0139], Takeda), and

causing each subsequent change to the data in the first data storage to be written to the third data storage ([0140], lines 3-10, Takeda).

Regarding Claims 3, 15, 18, and 21, the combination of DeKoning in view of Takeda, disclose the method wherein

when the portion of the data comprises an updated portion in the third data storage, the reading the portion of the data comprises reading the updated portion from the third data storage ([0140], Takeda)³.

Regarding Claim 4, the combination of DeKoning in view of Takeda, disclose the method wherein the second portion of the data is unavailable because the second portion of the data is corrupted (column 5, lines 34-43, DeKoning).

Regarding Claim 5, the combination of DeKoning in view of Takeda, disclose the method wherein the second portion of the data is unavailable because a device of the first data storage is unavailable (column 5, lines 34-43, DeKoning).

Regarding Claim 6, the combination of DeKoning in view of Takeda, disclose the method further comprising:

³ Examiner Notes: Fig.8, item 60, corresponds to the third data storage.

replicating data in the third data storage to fourth data storage accessible by the second host ([0141], lines 1-4, Takeda)⁴, wherein the fourth data storage cannot be accessed by the first host (column 6, lines 45-55, DeKoning).

Regarding Claim 7, the combination of DeKoning in view of Takeda, disclose the method wherein the copy of the data in the second data storage was copied from a previous version of the data in the first data storage at a previous point in time (column 6, lines 3-21, DeKoning).

Regarding Claim 8, the combination of DeKoning in view of Takeda, disclose the method wherein

the data in the second data storage is a log of changes made to data in the first data storage after a previous point in time (column 7, lines 22-40, DeKoning); and

the requested portion is a set of changes in the log of changes, wherein each change in the set of changes comprises a change to the portion of the data, wherein the change was made after the previous point in time (column 8, lines 18-31, DeKoning).

Regarding Claim 9, the combination of DeKoning in view of Takeda, disclose the method wherein the requesting the requested portion comprises:

⁴ Examiner Notes: Fig.8, item 62, corresponds to the fourth data storage.

identifying a set of changed regions of a first plurality of regions of the first data storage using a set of indicators, wherein each indicator of the set indicates whether at least one change was made to data in a respective region of the first data storage (column 8, lines 22-44, DeKoning), and;

adding each region of the set of changed regions to the requested portion (Fig.3; column 8, lines 18-21, DeKoning).

Regarding Claim 10, the combination of DeKoning in view of Takeda, disclose the method further comprising:

determining whether the data in each region of the first plurality of regions of the first data storage is synchronized with the copy of the data in a corresponding region of a second plurality of regions of the second data storage (column 8, lines 24-33, DeKoning); and

when the data in one region of the first plurality of regions is not synchronized with the copy of the data in the corresponding region of the second plurality of regions, identifying a set of unsynchronized regions of the first data storage, wherein each region in the set of unsynchronized regions is unsynchronized with a corresponding region of the second data storage ([0069], Takeda), and

forcing replication of the data in the set of unsynchronized regions to the copy of the data in the second data storage prior to requesting the requested portion ([0073-0074], Takeda).

3. Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over DeKoning (US Patent No. 6,691,245) filed October 10, 2000, in view of Takeda (US Patent Application No. 20040172509) filed June 23, 2003 as applied to claims 1-10 and 13-21 above, and further in view of Carlson (US Patent No. 6,377,959) filed May 20, 1996.

Regarding Claim 11, the combination of DeKoning in view of Takeda, disclose the method wherein

the determining whether the data in each region of the first data storage is synchronized with the copy of the data in the corresponding region of the second data storage (column 8, lines 24-33, DeKoning). However, the combination of DeKoning in view of Takeda are silent with respect to determining whether a lag in replication from the first data storage to the second data storage exists, and when the lag exists, determining that the first data storage and the second data storage are unsynchronized. On the other hand, Carlson discloses determining whether a lag in replication from the first data storage to the second data storage exists (column 7, lines 64-67, Carlson), and when the lag exists, determining that the first data storage and the second data storage are unsynchronized (columns 7-8, lines 67 and 1-10, respectively, Carlson). DeKoning, Takeda, and Carlson are analogous art because they are from the same field of endeavor of database recovery procedures. It would have been obvious to one of ordinary skill in the art

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at the time of the invention to incorporate Carlson's teachings into the DeKoning in view of Takeda system. A skilled artisan would have been motivated to combine as suggested by Carlson at column 2, lines 59-67, in order to satisfy a need within the art for a dual database system that maintains two databases with identical entries for fault tolerance. Therefore, providing an active database system which copies one record at a time while interleaving updates into the operation stream at the redundant database, thereby allowing the databases to be concurrent.

Regarding Claim 12, the combination of DeKoning in view of Takeda, and further in view of Carlson, disclose the method wherein the determining whether the lag in replication from the first data storage to the second data storage exists comprises:

examining a replication map for the first data storage, wherein the replication map comprises an indicator for each region of the first plurality of regions, the indicator for each region indicates whether data in a respective region of the first data storage have changed but have not yet been replicated (column 8, lines 22-44, DeKoning); and

when at least one respective region of the first plurality of regions has the indicator, determining that the lag exists (column 7, lines 64-67, Carlson).

(10) Response to Argument

Appellant argues claims 1-10 and 13-21 are patentable over DeKoning in view of Takeda. In particular, appellant argues Takeda does not teach reading a portion of data by reading the requested portion received from the second host and, “when a sub-portion of the portion of the data is not included in the requested portion [received from the second host, which was requested to provide the requested portion of a copy of the data in a second data storage], reading the sub-portion from the first data storage”.

Examiner respectfully disagrees. To begin, Takeda teaches receiving a copy request command from the secondary host, *which is the requested portion of a copy of the data*, and issuing a data read request to the primary host in order to read the requested data (see [0061-0062]). Next, Takeda teaches at paragraphs [0063-0065], wherein “*the data that had been stored in the PVOL before the journal acquisition process was started is not transferred to the secondary disk array device even when the journal copy processing was started. Therefore, it is necessary to copy these data (hereafter “initial data”) to SVOL from PVOL. In the present embodiment, an initial copy is used to transfer the initial data from the PVOL to SVOL. The initial data are transferred sequentially from the volume head area to the end of PVOL...The restore or restoration process involves updating or copying the data of PVOL in the SVOL using the journal that have been received from the primary disk array device according to the copy process*”. It is noted that the above citations discuss the process of an initial copy

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process wherein, when data that was not initially transferred to the SVOL (i.e., secondary volume, which is managed by the secondary host) from the PVOL (i.e., primary volume, managed by the primary host) by the journal acquisition process (which is noted as being the requested portion received – see [0042], lines 5-11), it then becomes necessary to copy the remaining data from the PVOL. Also, the “initial data” discussed within the citations above is a representation of a “sub-portion” of the portion of data, because the “initial data” was data that was not transferred to the secondary device, while some of the data was. As such, the journal copy is noted as being the requested portion that was read and the initial copy being the non-transferred data, which was not included in the requested portion and is therefore being read from the PVOL. As such, the combination of DeKoning in view of Takeda, do in fact teach upon the argued limitation.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner’s answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,
CLD
September 22, 2008

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